

First record of albinism in the paca *Cuniculus paca* (Rodentia, Cuniculidae) in southeast Mexico

Primeiro registro de albinismo na paca *Cuniculus paca* (Rodentia, Cuniculidae) no sudeste do México

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Abstract

Even though there have been reports of anomalies in the colouration of several species of neotropical mammals, these events are considered to be rare within natural populations. Here we report the first case of albinism in the paca (*Cuniculus paca*). During the months of June and July 2017, we obtained several images of an adult albino male using camera traps in the region of Sierra Norte in Oaxaca, in the southeast of Mexico, in a medium subdeciduous forest.

Keywords

camera trapping, Hystricomorpha, melanin, neotropical mammals, pigmentation

Skin, hair and eye colour in mammals mainly depends on the quantity, quality and distribution of melanin (Ito and Wakamatsu 2008; Fertl and Rosel 2009). This pigment is produced in melanocytes, which are primarily found in the epidermis and eye and hair follicles (Hofreiter and Schöneberg 2010). Alterations or mutations in the tyrosinase gene can result in a deficiency or decrease of melanin (Acevedo

and Aguayo 2008) and such conditions have been categorised as albinism (total absence of body, hair and eye colouration) (Acevedo and Aguayo 2008; Fertl and Rosel 2009), leucism (total or partial absence of pigmentation in the whole body except for the eyes and/or extremities which remain with dark or blue pigmentation) (Acevedo and Aguayo 2008; Fertl and Rosel 2009; Abreu et al. 2013) or piebaldism (loss of pigmentation in some parts of the body, but with normal eye colouration) (Fertl and Rosel 2009; Abreu et al. 2013).

Even though anomalies in colouration have been reported in many species of neotropical vertebrates, these events are considered to be rare (Abreu et al. 2013). Numerous cases of aberrations in colouration have been recorded in terrestrial mammals of small and medium size, such as primates (Espinal et al. 2016), ungulates (Veiga 1994; Puig et al. 2017), mustelids (Sobroza et al. 2016), procyonids (Silva-Caballero et al. 2014), marsupials (Abreu et al. 2013) and rodents (Oliveira 2009; Guevara et al. 2011; Brito and Valdivieso-Bermeo 2016).

In the case of rodents, of the 274 species that includes the suborder Hystricomorpha (Wilson et al. 2016), the presence of albinism has been documented only in five species of four families (Hystricidae, Erethizontidae, Caviidae and Octodontidae) (Romero et al. 2018), including a case of partial albinism in the agouti *Dasyprocta azarae* (Dasyproctidae) (Oliveira 2009). To date, there had not been any record of this abnormality in the paca (*Cuniculus paca*, Cuniculidae).

The paca is a caviomorph rodent with a neotropical distribution; it is solitary, territorial and nocturnal (Pérez 1992). It usually exhibits brown to dark brown colouration on both sides of its body from the neck to the ventral part, with three or four longitudinal stripes of light spots on the sides (Pérez 1992; Aranda 2000).

Even though Oliveira (2009) mentions albino pacas and agoutis, the reference cited by the author (Veiga 1994) only describes the case of an albino peccary. Therefore, the present work reports the first documented case of a paca with a completely white body during a demographic study of this species using camera trapping. The study was carried out from June 2016 to June 2018 in the region of Sierra Norte in Oaxaca, located in the southeast of Mexico, in the Municipality of Santiago Comaltepec, in the community of San Martín Soyolapam ($17^{\circ}33'50''N$, $96^{\circ}32'52''W$, elevation 690 m; Fig. 1). The area exhibits a hot humid climate with rainfall in the summer and the mean annual temperature ranges from $10^{\circ}C$ to $26^{\circ}C$ (INEGI 2005). The dominant vegetation is medium subdeciduous forest with fragments used as agricultural zones, grasslands, open areas and human settlements.

The albino paca was an adult male, which was recorded during seven nights at the same camera-trapping site, where a Bushnell Trophy CamTM camera with a passive infrared sensor was placed. The recordings occurred in the middle of the study (22 June, from 21 to 24 July and 27 and 28 July 2017). Although the cameras remained permanently active for another year after its sighting, this individual was not observed again. All records occurred between 21:55 and 05:02 hours, with temperatures ranging from 15 to $21^{\circ}C$. Five of the seven records occurred during the new moon and the other two at the start of the first quarter moon. An adult male with

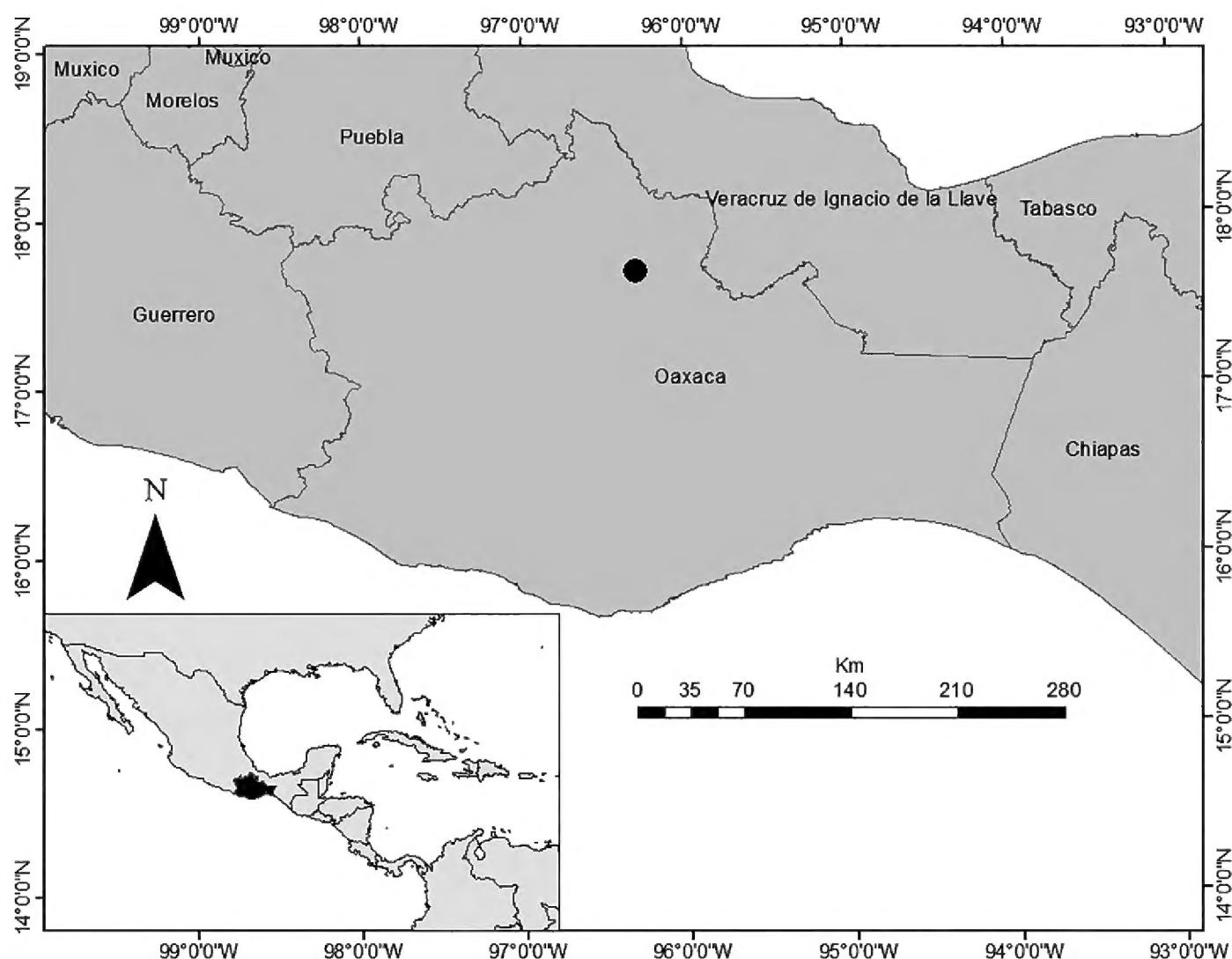


Figure 1. Location of record of albino paca (*Cuniculus paca*) at San Martín Soyolapam, Municipality of Santiago Comaltepec, in the Sierra Norte of Oaxaca, Mexico.

a completely white body can be observed in the photographs; however, the colour of its eyes could not be determined because the images were taken during the night and the eyes reflected the light from the camera trap (Fig. 2A–F). During the same period at the same site, we also recorded squirrels (*Sciurus* sp.), the white-nosed coati (*Nasua narica*), the collared peccary (*Pecari tajacu*), the tayra (*Eira barbara*), the Mexican agouti (*Dasyprocta mexicana*) and birds of large size, such as the great curassow (*Crax rubra*) and the West Mexican chachalaca (*Ortalis poliocephala*).

Animals that present conspicuous colouration, such as albinism, in natural conditions tend to have lower survival rates than individuals with normal colouration, since they are more susceptible to predators or less successful at capturing prey (Miller 2005; Silva-Caballero et al. 2014; Espinal et al. 2016). A reduction in pigmentation in prey species like the paca is considered to be a disadvantage because this condition increases the probability of detection by potential predators (Nedyalkov et al. 2014; Soboza et al. 2016). Even though chromatic disorders are associated with pathologies, such as sensory or nerve defects, anaemia, low fertility, a higher susceptibility to disease and poor vision (Acevedo and Aguayo 2008), which result in lower survival rates, adult individuals with different colour aberrations have been recorded (Espinal et al. 2016), as in the case of the present study.



Figure 2. Photographs of a paca (*Cuniculus paca*) with normal colouration (A) and an albino individual in a medium subdeciduous forest in the Sierra Norte of Oaxaca, Mexico (B–F).

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